

PATENT
HER07 P-107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No. : 09/710,769 Confirmation No.: 5666
Applicants : Thomas Gebele, Jürgen Henrich,
Stefan Bangert, Jürgen Honekamp,
Dr. Elisabeth Budke, Jürgen Ulrich
and Dr. Helmut Grimm
Filed : November 9, 2000
Group : 1763
Examiner : Parviz Hassanzadch
For : ELECTRODE ARRANGEMENT
Atty Docket No. : HER07 P-107
Customer No. : 28101

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

APPELLANT'S BRIEF (37 CFR 1.192)

This Brief is in furtherance of the Notice of Appeal filed in this case on June 23, 2003. The fees required under § 1.17(c) for filing this Brief are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This Brief is transmitted in triplicate (37 CFR 1.192(a)).

Respectfully submitted,

THOMAS GEBELE, JÜRGEN HENRICH,
STEFAN BANGERT, JÜRGEN HONEKAMP,
DR. ELISABETH BUDKE, JÜRGEN ULRICH
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By: Van Dyke, Gardner, Linn & Burkhardt, LLP

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Dated: September 23, 2003.

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Attention: Board of Patent Appeals and Interferences

Dear Sir:

TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION - 37 CFR 1.92)

Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on June 23, 2003.

Pursuant to 37 CFR 1.17(c), the fee for filing the APPEAL BRIEF is \$320.

Enclosed is a one-month extension of time to extend the due date for filing the APPEAL BRIEF to September 23, 2003. The extension fee due is \$110.

Attached please find a check in the sum of \$320 and a check in the sum of \$110. If any additional extension and/or fee is required, this is a request therefor to charge Account No. 22-0190. A duplicate copy of this Transmittal of Appeal Brief is attached.

Respectfully submitted,

THOMAS GEBELE ET AL.

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Dear Sir:

BRIEF ON APPEAL

Respectfully submitted,

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STEFAN BANGERT, JÜRGEN HONEKAMP,
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Dear Sir:

BRIEF ON APPEAL

1. **Real Party in Interest:**

The real party in interest is Applied Films GmbH & Co. KG.

2. **Related Appeals and/or Interferences:**

There are no related cases on appeal or in any interference proceedings.

3. **Status of the Claims:**

Claims 1-33 are pending in the application. Claims 7-10, 18, 19, 24 and 28-23 were withdrawn from consideration as being drawn to a non-elected species and method. Claims 1-6, 11-17, 20-23 and 25-27 are rejected. The rejections of claims 1-6, 11-17, 20-23 and 25-27 are hereby appealed. Claims 3-6, 11, 12, 15, 16 and 20-23 would be allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

4. Status of the Amendments:

There have been no amendments filed subsequent to the final rejection.

5. Summary of the Invention:

The present invention relates to a novel electrode arrangement for plasma-aided coating of a substrate, such as a beverage bottle, with a layer, such as a doped Si O_x material layer. Applicants' invention was developed to overcome the difficulties associated with conventional plasma-aided coating electrode arrangements in which particles evaporated from the anode electrode are deposited on the surface of the cathode electrode, which results in the surface properties of the cathode changing during the operation of the electrode arrangement. It is possible that such deposits may result in the arc discharge being extinguished and the cathode requiring replacement.

In contrast, Applicants' invention produces a cathode material surface that supports a plasma discharge that is more constant over time. Articles evaporated from the anode during operation of the plasma-aided coating apparatus are constantly removed in order to have a plasma discharge which is constant over time.

The cathode material surface is made of an evaporation-active part 27 supporting the plasma discharge and an evaporation-inactive part which is the remaining part of the cathode and which does not sustain any portion of the spark discharge. A gas supply 65 introduces a protective gas into an intermediate space 63 between a baffle 43 and the cathode surface. At least a part of the gas supplied from supply 65 escapes from intermediate space 63 through a baffle opening 45 towards the plasma discharge. The resulting gas current 35 is directed oppositely to the direction of current of undesirable particles 47 evaporated from the anode (see Fig. 2). These are the particles that would form an undesired deposit on the face of the cathode. In particular, the particles of gas current 35 will collide with the current of undesirable particles 47 and deflect same from their path through the baffle opening and prevent deposit of the particles on the cathode. The undesired effect of deposit material on the cathode is reduced (page 9, lines 12-21).

A motion-producing device, such as a motor 49, may be provided which turns the cathode and thereby moves the evaporation-inactive part over the surface of the cathode. This means that the cathode material surface is changing with time. This reduces the deposits of undesired particles 47 at the evaporation-active part of the electrode thereby supporting a more constant plasma discharge.

Claim 1 calls for:

An electrode arrangement for the plasma-aided coating of a substrate with a layer, comprising:

at least a first and a second material component which produces a plasma discharge;

an anode arrangement which defines said first material component at an anode material surface for evaporation;

a cathode arrangement which defines said second material component at a cathode material surface, said cathode material surface being constituted by an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge;

a gas supply for supplying protective gas in front of the cathode material surface to the evaporation-active part of the cathode material surface; and

a baffle arrangement exposing said evaporation-active part at a baffle opening for the plasma discharge and shading of the evaporation-inactive part correspondingly from the plasma discharge;

wherein said protective gas is so introduced into an intermediate space between the baffle arrangement and the cathode material surface that said supplied protective gas escapes at least partially through the baffle opening towards the plasma discharge from the intermediate space between the cathode material surface and the baffle arrangement.

Claim 2 calls for:

An electrode arrangement for the plasma-aided coating of a substrate with a layer, comprising:

at least a first and second material component which produces a plasma discharge;

an anode arrangement which defines said first material component at an anode material surface for evaporation;

a cathode arrangement which defines said second material component at a cathode material surface, said cathode material surface being constituted by an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge; and

a motion-producing device for moving said evaporation-active part, and thereby moving said evaporation-inactive part over said cathode material surface in order to reduce deposits of material due to the first material component on said cathode material surface.

Claims 3-6, 11, 12, 15 and 16 are grouped with claim 2.

Claims 13, 14 and 17 are grouped with claim 1.

Claim 25 is dependent on claim 1 and calls for the anode arrangement including a heatable crucible for liquefaction of the first material component.

Claims 26 and 27 are grouped with claim 25.

6. Issues:

1. Whether claims 2-6, 11, 12, 15 and 16 are unpatentable under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements.

2. Whether claims 1, 13, 14 and 17 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent Publication No. JP 11-100661 A to Akamatsu et al.

3. Whether claims 25-27 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Japanese Patent Publication No. 11-100661 A to Akamatsu et al. in view of International Patent Publication No. WO 00/46418 by Heinrich et al.

7. Grouping of Claims:

For the purpose of this appeal, claims 1, 13, 14 and 17 shall stand or fall together separate from the other claims. Claims 2-6, 11, 12, 15 and 16 shall stand or fall together separate from the other claims. Claims 25-27 shall stand or fall together separate from the other claims. It will be understood that these groupings of claims are being chosen for the purpose of expediting this appeal, but, in no way, should be construed as an admission that Applicants do not consider one or more of the individual claims in these groups to be separately patentable from any other claims in the same group.

8. Arguments:

I. Whether claims 2-6, 11, 12, 15 and 16 are unpatentable under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements.

It is fundamental that Applicants are entitled to claim what they consider to be their invention as long as it is reasonably understood by the skilled artisan. Claim 2 corresponds to a combination of originally filed claim 1 and claim 2 (which was originally dependent on claim 1). Therefore, Applicants clearly intend to consider claim 2 to be their invention without further elements.

Features, which are merely preferred, are not to be considered critical. In re Goffe, 542 F.2d 564, 191 U.S.P.Q. 429 (CCPA 1976). Applicants have described in the specification a preferred embodiment of the invention. If the scope of the subject matter embraced by the claims is clear, and Applicants have not, otherwise, indicated that the invention is to be of a different scope from that defined in the claims, the claims comply with 35 U.S.C. § 112, second paragraph. Applicants are not limited to claiming the preferred embodiments. Instead, Applicants are entitled to claim their invention as broad as the prior art disclosure will allow. In re Rasmussen, 650 F.2d 1212, 211 U.S.P.Q. 323, 326 (CCPA 1981). Furthermore, a claim may be broader than the specific embodiment disclosed in the specification. In re Gardner, 480 F.2d 879, 178 U.S.P.Q. 149 (CCPA 1973). For example, in Ex parte Hendrickson, 42 U.S.P.Q. 634 (Pat. Off. Bd. App. 1939), the invention related to a connecting structure at the ends of railway cars and for surrounding the passageway between the railway cars to protect people from going from one car to another. The claim was rejected as being indefinite. The Board found that the Examiner's holding of indefiniteness

was really a rejection relating to the scope of the claim that used the phrase "guides associated with the sides of the diaphragm." The Board found the term not to be indefinite, but merely broad.

There is no location in the specification where the use of a "gap" or a "baffle" is stated to be an essential item or necessary to practice the invention. Not only does the specification fail to state that such elements are essential, in its broadest description, these elements are not mentioned. For example, in the specification beginning on page 2, lines 15-25, it is stated:

The invention is characterized in that the cathode material surface is divided up into two regions, namely, an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge. At a given size of the cathode material surface and a given intensity of the plasma discharge there is, consequently, as compared with a cathode material surface not divided into two regions, an increased intensity of the plasma discharge per unit area in the evaporation-active part.

Furthermore, in this case, a movement-producing means is provided which changes the arrangement of the evaporation-active part on the cathode material surface with time and, thus, moves the evaporation-active part over the cathode material surface. This means that portions of the cathode material surface, which are constantly changing with time, support the plasma discharge.

It is clear that Applicants do not need to set forth in the claims every structural element of the preferred embodiment. Otherwise, the inclusion of a claim in the application would be meaningless because each and every element set forth in the preferred embodiment would need to be put forth in the claims rendering the claims useless.

Accordingly, Applicants respectfully submit that claims 2-6, 11, 12, 15 and 16 are patentable under 35 U.S.C. § 112, second paragraph.

II. Whether claims 1, 13, 14 and 17 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent Publication No. 11-100661 A to Akamatsu et al.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Berdegaa Brothers v. Union Oil Co. of California, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Moreover, "the identical invention must be shown in as complete detail as is

contained in the claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 sets forth, for example, that protective gas is introduced into an intermediate space between the baffle arrangement and the cathode material surface, that the supplied protective gas escapes at least partially through the baffle opening towards the plasma discharge from an intermediate space between the cathode material surface and the baffle arrangement.

A representative figure of Japanese Patent Publication No. 11-100661 A to Akamatsu et al. (herein after referred to as “Akamatsu”) is as follows:

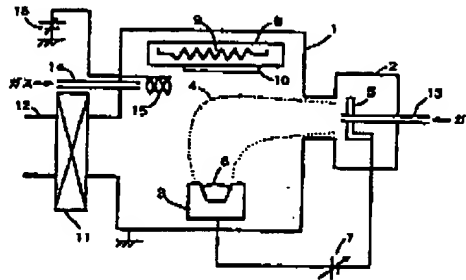


Fig. 1

Akamatsu discloses a cathode section 2 having an electrode 5 and gas introducing tubes 13 and 14. Even if it is assumed for the purpose of discussion that gas introducing tube 13 supplies a protective gas, it does not disclose the claim element of the protective gas being introduced into an intermediate space between a baffle arrangement and the cathode material surface. As shown, gas introducing tube 13 introduces the gas forward of the cathode material surface. It is not possible to supply a protective gas onto the evaporation-active part of the cathode material from a distance in front of the cathode. Therefore, Akamatsu does not disclose that the protective gas is introduced into an intermediate space between the baffle arrangement and the cathode material surface, which is important for preventing contamination of the cathode material surface by anode material.

Moreover, Akamatsu explicitly discloses that gas-introducing pipes 13 and 14 introduce an atmospheric gas, not a protective gas. Because Akamatsu does not introduce a protective gas, it is clear that the gas introducing tubes 13 and 14 cannot be used for preventing deposits on the cathode material surface. In addition, there is no suggestion in Akamatsu of modifying the gas-introducing tubes 13 and 14 for use in preventing deposits on the cathode material surface.

Other claim elements are missing as well from Akamatsu. There is nothing in Akamatsu that corresponds with an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge in combination with a baffle arrangement exposing the evaporation-active part at a baffle opening for the plasma discharge and shading of the evaporation-inactive part correspondingly from the plasma discharge. In Akamatsu, the cathode section is illustrated schematically and, therefore, cannot be argued to show the invention in as complete detail as is claimed in claim 1 as it pertains to this claim element.

In conclusion, the invention, as defined in claims 1, 13, 14 and 17 of the present application, is not disclosed in an enabling fashion by Akamatsu. While Akamatsu may disclose an apparatus for more efficiently activating atmospheric gas in the plasma chamber, the present application claims an electrode arrangement for the plasma-aided coating of a substrate having a cathode material surface being protected against the contamination by deposits of anode material. For this purpose, a baffle arrangement defining an evaporation-active part and an evaporation-inactive part of the cathode material surface and further a gas supply for supplying protective gas onto the evaporation-active part of the cathode material surface are provided as defined in the rejected claims. Moreover, the device is designed so as to introduce the protective gas into an intermediate space between the baffle arrangement and the cathodic material surface.

Applicants respectfully urge that claims 1, 13, 14 and 17 are patentable under 35 U.S.C. § 102(b).

III. Whether claims 25-27 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Japanese Patent Publication No. 11-100661 A to Akamatsu et al. in view of International Patent Publication No. WO 00/46418 by Heinrich et al.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or references when combined must teach or suggest all of the claimed limitations. The teaching or suggestion to make the claimed combination a reasonable expectation of success must both be found in the prior art and not based on

Applicants' disclosure. In re Vaack, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).
See M.P.E.P. § 2143.

Claims 25-27 are all dependent on claim 1 as a base claim and, thereby, incorporate by reference all of the elements of claim 1. As set forth above, Akamatsu does not anticipate claim 1 because it fails to disclose several elements thereof in an enabling fashion. Even if there was motivation to combine the references, which is not conceded, Heinrich et al. does not disclose the elements missing from Akamatsu. Heinrich et al. discloses a device for coating a substrate having an anode 2 and a cathode 29. There is no disclosure in Heinrich et al. of a protective gas that is introduced in an intermediate space between a baffle arrangement and a cathode material surface that the supplied protective gas escapes at least partially through the baffle opening towards the plasma discharge from an intermediate space between the cathode material surface and the baffle arrangement. Therefore, the prior art references when combined do not teach or suggest all of the claim limitations.

Accordingly, Applicants respectfully urge that claims 25-27 are patentably distinguishable over Akamatsu in view of Heinrich et al. or any other reference of record.

9. Conclusion:

For the reasons advanced above, Applicants respectfully contend that each of the appealed claims is patentable. Therefore, reversal of all of the rejections of the claims is respectfully solicited.

Respectfully submitted,

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APPENDIX

REJECTED CLAIMS

Claims 1-6, 11-17, 20-23 and 25-27.

1. An electrode arrangement for the plasma-aided coating of a substrate with a layer, comprising:

at least a first and a second material component which produces a plasma discharge;
an anode arrangement which defines said first material component at an anode material surface for evaporation;

a cathode arrangement which defines said second material component at a cathode material surface, said cathode material surface being constituted by an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge;

a gas supply for supplying protective gas in front of the cathode material surface to the evaporation-active part of the cathode material surface; and

a baffle arrangement exposing said evaporation-active part at a baffle opening for the plasma discharge and shading of the evaporation-inactive part correspondingly from the plasma discharge;

wherein said protective gas is so introduced into an intermediate space between the baffle arrangement and the cathode material surface that said supplied protective gas escapes at least partially through the baffle opening towards the plasma discharge from the intermediate space between the cathode material surface and the baffle arrangement.

2. An electrode arrangement for the plasma-aided coating of a substrate with a layer, comprising:

at least a first and second material component which produces a plasma discharge;
an anode arrangement which defines said first material component at an anode material surface for evaporation;

a cathode arrangement which defines said second material component at a cathode material surface, said cathode material surface being constituted by an evaporation-active part supporting the plasma discharge and an evaporation-inactive part not supporting the plasma discharge; and

a motion-producing device for moving said evaporation-active part, and thereby moving said evaporation-inactive part over said cathode material surface in order to reduce deposits of material due to the first material component on said cathode material surface .

3. The electrode arrangement in claim 2 wherein said motion-producing device includes a baffle arrangement exposing said evaporation-active part at a baffle opening for the plasma discharge and shading off the evaporation-inactive part correspondingly from the plasma discharge and a drive moving the baffle opening in relation to said cathode material surface.
4. The electrode arrangement in claim 3 wherein said baffle opening is stationary in relation to said anode arrangement.
5. The electrode arrangement in claim 4 wherein said cathode material surface is in the form of a peripheral cylinder face of a cathode material body which is able to be turned by the drive about an axis of said cylinder face.
6. The electrode arrangement in claim 3 wherein said cathode material surface is in the form of a peripheral cylinder face of a cathode material body which is able to be turned by the drive about an axis of said cylinder face.
11. The electrode arrangement in claim 3 wherein said baffle opening fits like a hood at least partially around said cathode material surface for the formation of said evaporation-inactive part, which does not support the formation of the plasma discharge.
12. The electrode arrangement in claim 4 wherein said baffle opening fits like a hood at least partially around said cathode material surface for the formation of said evaporation-inactive part, which does not support the formation of the plasma discharge.
13. The electrode arrangement in claim 1 including a gas supply for supplying protective gas in front of the cathode material surface.
14. The electrode arrangement in claim 13 wherein said protective gas is supplied at the evaporation-active part of the cathode material surface.

15. The electrode arrangement in claim 3 including a gas supply for a protect gas is so introduced into an intermediate space between the baffle arrangement and the cathode material surface that the supplied protective gas escapes at least partially through the baffle opening toward the plasma discharge from the intermediate space between the cathode material surface and the baffle arrangement.
16. The electrode arrangement in claim 15 wherein the protective gas is supplied on the rear side, facing away from the baffle opening, of the cathode material surface.
17. The electrode arrangement in claim 1 wherein said first and second material components produce an arc discharge.
20. The electrode arrangement in claim 1 including cleaning means for removing material deposits at said evaporation-inactive part of said cathode material surface.
21. The electrode arrangement in claim 20 wherein said cleaning means comprises a stripping means.
22. The electrode arrangement in claim 21 wherein said cleaning means comprises at least one of (i) a brush, (ii) a device abrasively treating the cathode material surface, and (iii) a device processing the cathode material surface in a chip-removing manner.
23. The electrode arrangement in claim 1 including a follow-up device which keeps a substantially constant clearance between said anode material surface and said evaporation-active part of said cathode material surface.
25. The electrode arrangement in claim 1 wherein said anode arrangement includes a heatable crucible for liquefaction of said first material component.
26. The electrode arrangement in claim 1 wherein said first material component comprises silicon.
27. The electrode arrangement in claim 26 wherein said second material component comprises one of copper, zinc, brass and magnesium.